

A telescoping basket to contain textile articles during the phases included in the dyeing process

DESCRIPTION

Technical field

- 5 The present invention relates to a basket to perform machine dyeing of articles that are normally dyed in cabinets with drawers of another type and that require more burdensome processes in terms of time.

State of the art

- 10 Currently, the process to dye articles takes place essentially using two types of equipment depending on the characteristics of the untreated article and the characteristics desired for the finished product.

- 15 The dyeing process comprises a first phase to wet the articles being treated with water, a second phase for the actual dyeing, during which the articles are immersed in a dye bath, a third centrifugation phase to aid removal of the excess dye liquor and a drying phase.

- 20 Generally, said dyeing process takes place utilizing large baskets inside which the articles to be dyed are amassed and subsequently subjected to all the phases related to the dyeing process inside baskets. Some specific articles, for example microfiber hosiery articles and pre-pressed articles, require different treatment. In particular, microfiber articles cannot be treated in normal baskets as this could cause problems of uneven dye diffusion due to a distribution of the material inside the basket that prevents the dye liquor from reaching the entire content and during circulation of the dye bath this uneven distribution can be worsened by the articles amassing only in some areas of the basket causing folds to form and consequent problems of rope marks.

- 25 Pre-pressed articles cannot be placed in baskets to be subjected to the dyeing process for different reasons. In fact, if these articles were amassed inside the basket, during the phases of the dyeing process they would lose their folds.

30 Articles to be dyed that cannot be amassed inside traditional dyeing baskets are placed in cabinets provided with drawers, inside which these articles are positioned to guarantee correct and even wetting by the dye liquor in the case of microfiber articles and maintaining of the fold in the case of pre-

pressed articles.

Currently however, these cabinets are not suitable to perform all phases of the dyeing process. In fact, the articles are placed inside said cabinets to be subjected to the first wetting phase and to the second actual
5 dyeing phase. After these phases the articles must be transferred manually by an operator from the cabinet with drawers to a specific basket suitable to hold them to be subjected to the centrifugation phase and eliminate excess dye from the fibers.

This mandatory transfer requires further handling procedures and
10 additional times in the overall process, with consequent increase in costs and risk of damaging the articles.

Object and summary of the invention

The object of the present invention is to produce a basket suitable to contain articles to be dyed and suitable to perform all the phases of the
15 dyeing process, eliminating the need to transfer the articles being treated to other containers.

More specifically, the object of the present invention is to produce a basket to hold articles to be dyed that cannot be amassed in traditional baskets, but which must be placed in an orderly fashion and according to a
20 layout that allows correct and complete dyeing to be performed.

This and other objects and advantages, which shall appear clear to those skilled in the art by reading the text hereunder, are obtained with a basket comprising concentric and superimposed horizontal plane surfaces; said plane surfaces constitute an extensible structure as the plane surfaces
25 contiguous with one another are connected by means of extensible hinge elements. Access to said plane surfaces is regulated by the presence of vertical side elements that can be closed in contact with one another. The basket according to the invention can thus adopt an open position – in this case the sides are spaced apart – to allow operators access to the
30 superimposed plane surfaces, and a closed position – with the sides closed and in contact with one another – to treat the articles contained and/or lift and/or move and/or transport the basket.

The basket can comprise locking catches to prevent extension of the structure and maintain a closed position. Alternatively, and preferably, a rigid
35 structure can be provided connected to a portion of the extensible structure

and constituting a support for the basket in the closed position. In this way it is unnecessary to perform any operation on the basket to allow lifting and transport. It is in fact sufficient to hook a lifting device either to the extensible structure or to the rigid structure. In the first case, the extensible structure will
5 be extended, the plane surfaces will be spaced apart and access will be gained to the plane surfaces for loading and unloading. In the second case, the entire basket will be lifted with the plane surfaces in the position closest to one another i.e. packed.

According to a preferred embodiment of the basket according to the
10 invention, it includes a rigid structure with a hollow cylinder surrounded by disk-shaped horizontal mesh plane surfaces, concentric to the hollow cylinder and all superimposed, extending between inner vertical sides and outer vertical sides. Said plane surfaces also comprise lower supports for the meshes disposed radially between the inner sides and the outer sides and
15 upper linear elements also disposed radially between the inner and outer sides. Jointed hinges are provided between one plane surface and the adjacent plane surfaces to allow said plane surfaces to move away from one another in correspondence with an aperture of said jointed hinges. The dimensions of the vertical sides of each plane surface are such that they
20 encompass the outer surface of said cylinder and allow sliding on said surface and with the inner vertical side of the disk disposed in a lower position connected to the lower portion of the hollow cylinder.

The jointed hinges can comprise two linear elements or two pairs of linear elements disposed parallel and hinged to each other in correspondence
25 with one end, with the free ends hinged to supports integral with two vertically contiguous plane surfaces.

According to a different embodiment of the basket according to the invention, the joint between the element connecting two contiguous plane surfaces can be provided with a single linear element hinged at one end to the
30 upper plane surface and connected slidingly to the lower plane surface by means of a pin and slot coupling. The two examples indicated above of connection between two plane surfaces can also be produced involving non-contiguous plane surfaces and in any case guaranteeing the possibility of moving the plane surfaces away from one another and consequent access to
35 said plane surfaces.

The basket according to the invention may adopt a closed position and an open position. In the closed position the corresponding contiguous vertical sides are in contact with one another and access cannot be gained to the articles disposed on the mesh plane surfaces. Instead, in the open position
5 the plane surfaces are spaced apart vertically and access can be gained to the mesh plane surfaces to handle the articles and especially to load articles to be dyed or unload dyed articles. A handle to attach lifting means is provided in correspondence with the highest plane surface; using the handle to lift the highest plane surface, the lifting means cause the jointed hinges to
10 open progressively and consequently the plane surfaces move progressively away from one another; obviously, by lowering the highest plane surface again the basket returns to the closed position. A second handle is provided in correspondence with the upper portion of the hollow cylinder; by attaching the lifting means to this second handle the basket is lifted in the closed position,
15 as this does not cause the plane surfaces to move reciprocally away from one another.

It must be clear that the shape of the basket according to the invention is preferably cylindrical in order to use existing devices for wetting and/or dyeing and/or centrifugation and all devices related to the treatment of articles
20 in the phases preceding and/or subsequent to the dyeing process. Moreover, other forms for the production of the basket compatible with any different requirements are also possible.

Further advantageous features and embodiments of the invention are indicated in the accompanying claims.

25. **Brief description of the drawings**

The invention will now be better understood by following the description and accompanying drawing, which shows a non-limiting practical embodiment of the Invention.

Figure 1 shows a front view of the basket according to the invention in
30 the closed position;

Figure 2 shows a front view of the basket according to the invention in the open position;

Figure 3 shows an enlargement of the hinge connecting the plane surfaces in the open position according to the detail III in Figure 2;

35 Figure 4 shows a front view of the hinge in Figure 3 according to the

line IV-IV;

Figure 5 shows a detailed side view of the hinge in Figure 3 in the open position;

Figure 6 shows a front view of the hinge in Figure 5 according to the
5 line VI-VI;

Figure 7 shows a detailed side view of a further example of the hinges connecting the plane surfaces in the open position;

Figure 8 shows a detailed front view of a further example of the hinges connecting the plane surfaces in the open position;

10 Figure 9 shows a plan view of the basket according to the invention;

Figure 10 shows a perspective view of a different embodiment of the basket according to the invention in the closed position;

Figure 11 shows a perspective view of the basket in Figure 10 in the open position;

15 Figure 12 shows a perspective view of a further embodiment of the basket according to the invention in the closed position; and

Figure 13 shows a perspective view of the basket in Figure 12 in the open position.

Detailed description of the preferred embodiments of the invention

20 With initial reference to figures 1 and 2, the basket according to the invention – generically indicated with 1 – comprises a hollow cylinder 3 with a vertical axis, a plurality of disk-shaped horizontal mesh plane surfaces 5, 7, 9, 11, 13 extending between a vertical side 5A, 7A, 9A, 11A, 13A in correspondence with the inner circumference and a vertical side 5B, 7B, 9B, 11B, 13B in correspondence with the outer circumference. The plane surfaces are connected and supported between the respective sides by linear supports 5C, 7C, 9C, 11C, 13C disposed radially and angularly distanced from one another, for example by about 30°, between the two sides and below the plane surfaces.

30 The plane surfaces 5, 7, 9, 11, 13 are concentric with the hollow cylinder 3, superimposed and connected to one another by means of jointed hinges 21 so that they can be moved away from one another in an axial direction. The dimensions of the inner vertical side 5A, 7A, 9A, 11A, 13A of each of said plane surfaces 5, 7, 9, 11, 13 are such to externally encompass
35 the hollow cylinder 3 and allow each of said surfaces to slide along said outer

surface of the cylinder 3.

In addition to the lower linear supports 5C, 7C, 9C, 11C, 13C disposed radially for connection to the sides, each plane surface 5, 7, 9, 11, 13 is provided with four linear elements 5D, 7D, 9D, 11D, 13D, also disposed
5 radially but spaced apart angularly from one another through about 90° to fasten by means of said connecting jointed hinges 21 to the plane surface above. Said hinges (Figures 3-6) include four linear components 21A 21B 21C 21D associated in parallel in twos and jointed at the ends by means of a hinge. More precisely, the pairs of components are joined to one another with
10 a hinge 21E in correspondence with one of the ends, as the other ends are connected, again by means of hinges 21F, 21G, to the upper plane surface in correspondence with the lower supports 13C and to the lower plane surface in correspondence with the upper linear elements 11D.

Stops of the type indicated with 11E are also provided adjacent to the
15 hinge 21G connecting to the upper linear elements 11D so as to prevent complete opening through 180° of the joint between the two pairs of components and limiting the angle to even slightly lower values.

A closing position of the basket according to the invention is determined when (Figures 3 and 4) the contiguous outer vertical sides and the
20 contiguous inner vertical sides come into contact with one another. In this position, the pairs of parallel elements 21A, 21B and 21C, 21D constituting the jointed hinge 21, are partially penetrated by the lower supports 7C, 9C, 11C, 13C and by the upper linear elements 5B, 7B, 9B, 11B. In fact, the components constituting each pair 21A, 21B and 21C, 21D, are connected in
25 parallel but spaced slightly apart to allow said penetration and allow the basket 1 to close. Moreover, in the closed position, in correspondence with the contact point between two contiguous sides, for each jointed hinge there is a space between the fastening elements of said jointed hinges 5B, 7B, 9B, 11B and 7C, 9C, 11C, 13C inside which the hinge pins 21E are enclosed
30 between one pair and the other.

According to an alternative embodiment of the basket according to the invention, the connection 121 between contiguous plane surfaces can comprise (see Figures 7 and 8) a linear element 121B connected by means of a hinge 121F to the lower linear support 113C of the upper plane surface and
35 slidingly connected by means of a pin 121G and slot 151 coupling to an upper

linear element 111D of the lower plane surface.

The lower plane surface 5 is rigidly connected to the lower portion of the hollow cylinder 3 in correspondence with the inner vertical side 5A. The highest plane surface 13, vice versa, is provided with a handle 15 hinged to two of the upper elements 13B disposed in diametrically opposed positions with respect to the inner side 13A and provided with a hooking hole 17 to allow lifting by suitable means. A second hooking hole 25 is provided on a linear element 23 disposed inside the hollow cylinder 3 along a diameter in correspondence with the upper end of said cylinder 3.

In practice, the basket according to the invention may adopt a closed position (see Figure 1) and an open position (see Figure 2): the closed position is for the wetting, dyeing and centrifugation phases of the articles disposed inside the basket 1, while the open position is for handling the articles during the phases to position them on and remove them from the plane surfaces of the basket. To change from the closed position to the open position, suitable lifting means are connected to the handle 15 in correspondence with the hole 17 and activated to lift the superimposed plane surfaces, moving them away in a vertical direction. In this way access can be gained to the various mesh plane surfaces 5, 7, 9, 11, 13 by one or more operators who can handle the articles, positioning them on said plane surfaces or removing them from the basket. Naturally, change from the open position to the closed position takes place with the reverse procedure, that is – by using the lifting means – to lower the handle 15. The lifting means can be of any type, for example composed of a winch on a bridge crane.

The outer sides of each plane surface can be provided with specific through holes that facilitate removal of the dye liquor during the centrifugation phase.

The second hooking hole 25, provided on an element 23 integral with the cylinder 3, allows the basket 1 to be lifted in the closed position using suitable means to transport it through devices for wetting and/or dyeing and/or centrifugation and/or to transport the basket according to the invention for any other purpose.

The layout of the hollow cylinder 3 allows a compact construction of the basket to be obtained. Nonetheless, other configurations are not excluded, as mentioned hereunder.

Figures 10 and 11 show an alternative embodiment of the basket according to the invention. In this example the rigid structure 203 is positioned outside the plane surfaces. This layout nonetheless allows lifting and moving of the basket as hooking points 225 are provided to apply a lifting force F.

5 Figures 12 and 13 show a further embodiment of a basket according to the invention. In this case the basket does not have a rigid structure. The presence of catches 335 that can be activated allows the structure to be extensible, with the catches released, or rigid, with the catches activated. In this case a single hooking point 333 is necessary, suitable to determine
10 extension of the structure with the catches 335 released or transport of the closed structure if the catches 335 are activated.

As shall be apparent from the description hereinbefore, the basket allows, in normal dyeing machines, dyeing of articles that currently require the use of devices with drawers. The articles to be dyed may in fact be laid on the
15 various plane surfaces constituting the basket. By moving the plane surfaces against one another, the basket can be inserted into the dyeing machine and subjected to a normal dye cycle (if necessary with prior wetting), as occurs with traditional baskets in which the articles are disposed randomly. In the basket according to the invention, nonetheless, the articles maintain their
20 original position. After dyeing, if the type of article allows this, the basket can be used to perform a centrifugation operation. Therefore, the basket is treated and handled as a normal dyeing basket, but allows handling of articles that cannot be dyed randomly, but must be laid on a plane surface to be subjected to dyeing.

25 It is understood that the drawing merely shows a simplification provided solely as a practical illustration of the invention, as said invention may vary in forms and layouts without however departing from the scope of the concept on which said invention is based.